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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

NEWS LETTER

FOR APRIL 1941

Vol. VIII, No. 6 (Not for publication) June 1, 1941

FRUIT INSECT INVESTIGATIONS

Control by tree-injection tried on peach insects.--Tests of materials claimed to be effective against the peach borer and other insects by injection into the trees were made at Starke, Fla., by Oliver I. Snapp, of the Fort Valley, Ga., laboratory. The materials consist of oil of peach, 5 percent; oil of rose geranium, 2 percent; oil of sassafras, 1 percent; oil of citronella, 2 percent; and spirits of turpentine, 90 percent. The treatment was made by boring a hole into the heartwood of the tree at the ground line with a brace and bit, after which the hole was plugged with a cork stopper and from 1½ to 2 cc. of the formula injected into the hole with a hypodermic syringe, the needle of which was inserted through the cork. The top of the cork and surrounding bark of the tree was then painted over with ordinary blue paint. The originator of the treatment claimed that the rising of the sap would take the materials throughout the tree, killing all borers, scales, and other insects. Each of the 40 borers removed from these trees was alive 23 days after treatment, although the originator claimed that the formula would kill peach borers in about 9 days. All of the young scale on a peach tree used for the test were alive. Most of the old scales had been parasitized. The treatment caused serious injury to the cambium, bark, and heartwood of 4 of 14 trees examined for tree injury. At the time of the examination, this injury was confined to the area where the materials had been injected into the tree.

Removal of small darkling beetles from excelsior traps.--Use of the chloropicrin separator for removing small darkling beetles, chiefly Blapstinus rufipes Casey, from excelsior traps has proved successful, as reported by Dwight F. Barnes and Charles K. Fisher, of the Fresno, Calif., laboratory. The separator was first described in ET 21, by Donohoe, et al., as an apparatus for separating nitidulids from infested host material. About 13 drops of chloropicrin was used for each run. In 9 test runs with exposures of 1 and 2 hours, 1,679 of the beetles, or 97.8 percent of the 1,717 present, were separated from the trap contents. The average separation in 2 tests with exposures of 2 hours each was 97.4 percent and in 7 trials of 1 hour each it was 98.1 percent. The results of the individual tests are listed below. The only difficulty experienced was with 1 sample, not listed, which was water-soaked when placed in the separator. Separation of this lot was about 53 percent.

Lot No.	Material (excelsior)	Exposure (hours)	Adults removed	
			Number	Percent
1 ---	Pads	2	588	96.5
2 ---	From bag traps	2	194	100.0
3 ---	"	1	209	99.5
4 ---	"	1	121	97.6
5 ---	"	1	125	99.2
6 ---	"	1	73	96.1
7 ---	"	1	88	96.7
8 ---	"	1	153	96.8
9 ---	"	1	128	99.2
Total	--	--	1,679	--
Average	--	--	--	97.8

MEXICAN FRUIT FLY CONTROL

Conditions in the lower Rio Grande Valley.--Larval infestations were found on 343 properties in April. This number of infestations is somewhat below normal for this period of the year, and the number of infestations found throughout the regulated area for the entire season is slightly less than for the same period last year. The infestation this season is approximately 25 percent of that of two seasons ago. At no time during this year have traps taken flies in such numbers as to indicate that there was a very high fly population present in the groves. Fruit shipments declined to only 1,618 cars for the month. The total for the season, as of April 30, amounted to 26,216.8 carlots, 362.1 cars below the figure for the same period in 1939-'40. More than the normal amount of rainfall in every month since December 1940 has resulted in many groves being flooded for considerable periods of time. Harvesting of fruit in certain areas of the valley has been delayed materially, and in some instances serious damage to the groves is feared because of the excess water that could not be promptly drained.

JAPANESE BEETLE CONTROL

Reduced dosage of lead arsenate for treating nursery plots.-- In supplement No. 4 to Circular B.E.P.Q. 499, effective May 1, 1941, administrative instructions to inspectors on the treatment of nursery products, fruits, vegetables, and soil for the Japanese beetle were modified to reduce the dosage of lead arsenate applied to nursery plots containing growing plants and to coldframes, plunging beds, and heeling-in areas from the previous rate of 1,500 pounds per acre to 1,100 pounds per acre (or 26 lbs. per 1,000 sq. ft.) for initial treatments. On subsequent retreatments, sufficient lead arsenate must be applied to restore a concentration of 1,100 pounds per acre, as determined by chemical analyses, except that determination by chemical analyses of a concentration of 1,000 pounds per acre will be acceptable without retreatment. This revised schedule was authorized by the Chief of the Bureau after a restudy had been made by representatives of the Divisions of

Fruit Insect Investigations, Control Investigations, and Japanese Beetle Control of the early investigational data on which the original dosages were based. It was found that the margin of safety originally prescribed was in excess of present needs and that a reduction of approximately 25 percent would be warranted. Inasmuch as analyses of representative soil samples taken over an extensive area may vary as much as 100 pounds of lead arsenate per acre in indicating the content, a determination by analysis of a 1,000 pound-per-acre content was considered acceptable without further retreatment. If the lead arsenate content is shown by analysis to have fallen below 1,000 pounds per acre, it must be restored to the full 1,100 pounds. This reduction in dosage is expected to result in more extensive utilization by nurserymen of the lead arsenate treatment of soil plots in which stock eligible for Japanese beetle certification may be grown. The bulk of soil samples from treated plots now maintained by nurserymen were obtained by inspectors during April, with only a few scattered samples yet to be taken. Some 650 samples were collected during the month. This is considerably less than in previous years.

Classified growers report good Easter trade.--Classified nurseries and greenhouses from all parts of the Japanese beetle regulated area reported very good Easter business, in most cases with complete sell-outs of all blooming plants. Many dealers claimed that it was their best year since 1929. Some shortages of plants for the Memorial Day trade were predicted. Thirty carloads of nursery stock were certified in the New York City area during the month and 29 of these, originating on Long Island, were consigned mostly to the States of Michigan and Illinois. Most of the stock in 9 carloads shipped by 1 nursery was dug from a lead arsenate treated plot. Fumigated balled stock also made up a portion of this establishment's shipments. In addition to carload shipments there were odd lots of shrubs and small trees, and numerous truckloads of stock, all of which had to be certified. One Long Island nurseryman plans to grow 20,000 certified azaleas in a cloth-screened house this summer. These will be started in a certified greenhouse, and will be planted in a lead arsenate treated area under cloth before the season of adult-beetle flight. If this method proves successful for this grower, a larger number will be grown in this manner next year. Inspection of soil-free Japanese iris roots that had been washed under water pressure disclosed that Japanese beetle grubs were still lodged at the base of the roots. It was necessary to break the clumps into small divisions before thorough inspection could be made. During visits to New Jersey nurseries and greenhouses during the month, inspectors heard such statements as: "Mail orders increased 100 percent over last year." "An increase of 75 percent in express orders over 1940." "The best April in our history." "All azaleas sold and prices 20 to 40 percent higher--can't buy them anywhere." "Had to run 7 days a week for the past 2 weeks." "All stock from our lead-arsenate-treated plots sold--must buy in certified stock to fill our orders." "Entire stock cleaned out during April, the first time this has ever occurred." Certified shipments from the central Pennsylvania district reached the highest peak since 1937.

Tourists increase shipments from Mount Vernon.--Certificates issued to the Mount Vernon Ladies Association for shipment of plant material from the George Washington Estate indicate that the association is making more shipments than ever before. This is attributed to the increase in number of tourists and new workers in the Washington area. The Washington Cathedral, in the District of Columbia, has required the services of an inspector twice a week to inspect and certify herb plants sold there to tourists. Inspections in the area surrounding the District were extremely heavy during the first part of April. The larger shippers were the Government establishments and the Maryland State Forest Nursery. Daily inspections were required at these places. Shipments ranging from 50 to 50,000 soil-free trees were certified. Inspection work in the District of Columbia was heavy during the month, since department stores selling evergreens, trees, and shrubs are all unclassified and actual inspection must be made of any stock to be shipped out of the regulated area by these dealers.

Additional fumigation chambers approved.--Several methyl bromide fumigation chambers were constructed during the month and approved after tests were made by the treating section. A Maryland nursery built a chamber with a 400-cubic foot capacity. This readily accommodated a single treatment of 1,785 plants with soil balls from 3 to 10 inches in diameter. A nursery in northern Ohio completed a chamber 8 by 4 by 6 feet, having a capacity of 192 cubic feet. It is constructed of 14-gauge metal, electrically welded inside and out. It is very well constructed and has an excellent hinging device on the door. A fumigation chamber used by the Bureau of Plant Industry at Beltsville, Md., was also approved during the month. This box, now fitted as an atmospheric chamber, was one of the old vacuum fumigation chambers installed at the Plant Quarantine Inspection House at 12th Street and Constitution Avenue, Washington, D. C., before the Inspection House was razed and transferred to Hoboken, N.J.

Advancing plant growth hastens spring shipping season.--The unusually mild weather during the month started the nursery shipping season with a rush. Many nurseries were a month ahead of their usual shipping schedule. In the New York City area, record-breaking high temperatures after Easter resulted in the most active shipping season ever experienced in that district. In some instances, nursery employees worked night and day in an attempt to get out orders before the stock became too advanced for shipment. In spite of increased personnel and working hours, several nurseries were forced to cancel orders because of advanced growth. In New Jersey the warm weather in the middle of the month shortened the shipping season by 3 to 4 weeks. A large Pennsylvania nursery reported that it has been 33 years since they had experienced a spring as advanced as this year's.

Spring soil treatments for Japanese beetle control.--Applications of arsenate of lead to several isolated infestations in Indiana were completed during April. Treating in Indianapolis began on March 31 and was finished April 22, with coverage of 70.95 acres. At New Castle, 4.5 acres was treated from March 31 to April 3, inclusive. On April 4 and 5, 0.9 acre was treated in Richmond, after which 0.25 acre was treated in Warsaw on April 8. The total area treated in the State during this period was 76.6 acres.

Retired gypsy moth district inspector passes away.—Irving B. Newbegin, senior scientific aid and district gypsy moth inspector at Lynnfield, Mass., until his retirement because of failing health on April 1, 1937, died on April 19. Mr. Newbegin was born in 1873. He began work with the Federal Bureau of Entomology in 1907 on the gypsy moth project. For 30 years he was employed in connection with various phases of gypsy moth and brown-tail moth control work. He also handled Japanese beetle inspection and certification work while serving as district inspector in charge of the Lynnfield district. He is survived by a son and a daughter, both of Lynnfield.

Advanced gypsy moth hatching season.—While in the performance of their regular duties, district inspectors observed the hatching of gypsy moth eggs at various points in the New England infested areas. The hatching season was approximately 3 weeks earlier than in 1940; in fact, reports indicate one of the earliest hatching seasons on record. Hatching was first observed on April 20 in Massachusetts and on April 21 in New Hampshire and Vermont. The first hatching noted in Maine was on April 26; consequently, the regulation relating to the lining up and spraying of nursery stock presented for inspection was made effective on April 23. Brown-tail moth larvae were first observed feeding at Poland, Maine, on April 21. Webbing by tent caterpillar was first reported by the district inspectors in Massachusetts and Rhode Island on April 17, in Connecticut on April 21, in Vermont on April 26, and in Maine on April 27.

Temporary inspectors assist in gypsy moth inspection.—Twenty-one temporary inspectors were employed on nursery inspection work in the New England States during April. One of these, assigned to lumber inspection early in the month, was later transferred to nursery work. Eight inspectors were assigned to inspection work at a forest nursery in western Maine; 1 inspector was employed to handle work at nurseries in eastern and western Massachusetts; and 11 inspectors assisted in inspection of stock at nurseries in Connecticut and Rhode Island.

Inspectors help fight forest fires.—Owing to lack of rain throughout the New England States during April, there were many serious forest fires. At Fryeburg, Maine, more than 1,000,000 board feet of lumber was destroyed. The nursery inspectors stationed at Fryeburg were on two different occasions commandeered to fight forest fires.

Violation of intrastate Dutch elm disease quarantine reported to State authorities.—During the early part of April, Dutch elm disease crews discovered that beetle-infested elm wood had been removed from wood piles which they had prepared in Bethlehem Township, Albany County, a State quarantined area, and transported to Cohoes, N.Y., a point outside the regulated zone, by an individual engaged in the sale of stovewood. The point to which the elm wood was transported is approximately 15 miles north of the present disease area. The elm material in the woodyard at Cohoes was found to be heavily infested with Scolytus multistriatus Marsh. and Hylurgopinus rufipes Eich. This wood had been cut into stovewood lengths. Many pieces were beetle infested and from some of them beetles had emerged. From information supplied by the owner of the yard, it is believed the beetles had emerged before the wood was moved from Bethlehem

Township. All elm wood in the owner's present supply was peeled and the bark burned before any further emergence occurred. A lumber mill was also located in the Albany area in which a good portion of elm slabs were found to be beetle infested. This waste lumber, with a large part of the bark remaining on it, had been purchased by the Cohoes dealer. The matter was referred to W. H. Rankin, of the New York Department of Agriculture and Markets, who ordered an investigation.

Emergence of adult Hylurgopinus rufipes.--Activity of hibernating adult H. rufipes was noted in Connecticut in mid-April. Although no actual entrance holes were found, adults were observed flying and crawling on the outer bark. A change from lighter to darker shades was also noticed in overwintering larvae. In Sullivan County, N.Y., it was noted that this species was active this year at a much earlier date than in the past. On April 21, while removing a tree that had been tagged as potential beetle material, the men noted in the rough bark numerous entrance holes containing fresh frass. The females were well along in the construction of their brood gallery, some channels an inch in length having been constructed.

Clean-up necessary after logging operations.--In the wake of a logging operation carried on in the black-dirt section of Warwick Township, Orange County, N. Y., several acres of ground were left littered with large quantities of slash, intermingled with hundreds of elms ranging in diameter from 4 to 10 inches. Since all of the elm was potential beetle material, permission was obtained to sort the elm from the other material in order that it might be destroyed. This work was started early in the month. It was soon found that it involved a more lengthy operation than was first anticipated. Approximately 4 weeks of the sanitation crew's time will be needed to complete the clean-up operations.

Fire hazard.--The fire hazard in woodland areas was very acute during the month, owing to the continued dry weather. Field employees in various sections of the work area were summoned by those in authority to assist in extinguishing and preventing the spread of forest fires. A scout crew working along Chadwick Lake, in Orange County, N.Y., was summoned by a State Trooper to aid in extinguishing a small forest-and-grass fire in the vicinity of the lake on April 8. This fire, apparently set by the property owner, threatened to cause considerable damage, but hasty action by the scouts quickly extinguished the blaze.

District offices closed.--The Bridgeport, Conn., district office and garage were discontinued because of constant loss of W. P. A. personnel, a good part of which has been absorbed by the industries in the Bridgeport area engaged in producing materials for National defense. The Morrisville, Pa., district office and garage were also closed on April 30, as the reduced W. P. A. force did not warrant the retention of the garage in this district. The men formerly operating out of the Morrisville garage will now work out of the Philadelphia field headquarters.

Trucker intercepted with contraband.--A truck hauling elm wood into the town of Derby, Conn., was intercepted and the driver of the truck upon request returned the load of elm wood to the Dutch elm disease infected area, where it was burned at one of our burning sites. An investigation of the matter revealed that the driver did not know the difference between elm and other wood and that he was an unwitting violator.

Surface stripping for coal produces beetle material.--In the course of elm-sanitation operations in the Wilkes-Barre, Luzerne County, Pa., area, it was found that surface stripping for coal at one location had caused the breakage of numerous limbs, as well as entire elm trees, and had produced wood highly suitable for bark-beetle invasion. This wreckage was cut and destroyed late in the month.

Owners overestimate their fuel requirements.--A spring check-up of elm wood left for fuel under fuel agreements was completed during the first week in April in Ulster and Albany Counties, N.Y. It was found that only 49 piles were disposed of out of 131 piles left under agreement.

FOREST INSECT INVESTIGATIONS

Termites and national defense.--R. C. Brown and B. H. Wilford, of the New Haven, Conn., laboratory, have visited defense housing projects of the U. S. Housing Authority and Public Building Administration, and U. S. Army cantonments and Naval and Air bases in New York and New England to confer with officials relative to construction and maintenance of buildings to prevent termite attack. In some instances an opportunity has been afforded to discuss construction details while the projects were in the blueprint stage and to make recommendations for proper termite-proof construction. In other cases, notably Army cantonments, where construction has been completed, recommendations have been made concerning the maintenance of the buildings to minimize termite attacks. It is believed that these contacts have already resulted in considerable savings in initial construction expense and have also reduced maintenance costs appreciably.

Large demonstration for control of white pine weevil.--S. F. Potts, New Haven, reports that several hundred acres of white pine plantations were treated with concentrated spray for control of the white pine weevil (Pissodes strobi Peck), in Connecticut and New York, in cooperation with the Connecticut State forester and New York Conservation Department. These areas were covered at the rate of about 3 acres per man-day, using approximately 4 gallons of lead arsenate concentrate per acre, at a total per acre cost of about $2. For most of this work the equipment consisted of an ordinary knapsack sprayer or fire pump to which was attached a simple but special type of extension rod and a nozzle for finely atomizing the spray in the form of a narrow, solid cone.

Conifers treated for control of Pales weevil.--According to Mr. Potts, good control of Hylobius pales (Hbst.) was obtained by the application of concentrated spray to conifers in plantations, beds, and heeled-in bundles. The cost of treatment was about $1.50 per 1,000 trees in plantations and about 25 cents per 1,000 trees in beds and bundles.

More parasites for LeConte pine sawfly outbreaks.--W. F. Sellers, New Haven, reports that during April this laboratory supplied from 300,000 to 400,000 Microplectron fuscipennis Zett., a gregarious chalcid parasite, for release in the pine plantations of the Tennessee Valley Authority that have been severely infested by the native LeConte's sawfly in the vicinity of Wilson Dam, Ala. This introduced parasite of the European spruce sawfly will attack practically all species of Diprion and Neodiprion sawflies. LeConte's sawfly cocoons are readily attacked by M. fuscipennis under laboratory conditions. This shipment is intended for release in newly discovered infestations, but at the same time will supplement the 30 colonies supplied by the New Haven laboratory last November for release in the same general area.

Dispersion of Hylurgopinus rufipes.--D. O. Wolfenbarger, of the Morristown, N. J., laboratory, has obtained data on the hibernating activities of the native bark beetle (H. rufipes Eich.) near points of emergence. Observations were made at two different points in two different years. One locality, Allamuchy, N. J., was characterized by an unusual abundance of beetles. The other, at Lanesboro, Pa., had a normal beetle density. Beetle density was estimated by the amount of beetle-infested logs or trees at the source, and by the numbers of beetles in the trees about the source. The data indicate that H. rufipes enters nearby trees for hibernation and, as the distance from the source increases, the number of beetles decreases. This is shown in the tabulation below.

Distance from source (feet)	Beetles found per square foot of bark area (number)
Allemuchy, N. J.:	
0	23
60	11
320	2
816	1
Lanesboro, Pa.:	
2	16.5
30	1.9
66	0.7
71	0

In obtaining the above data the outer bark of green healthy elm trees was carefully cut away in order to locate any hibernating beetles. One or more square feet of bark area per tree, at diameter breast height, was shaved and examined.

GYPSY MOTH AND BROWN-TAIL MOTH CONTROL

Working conditions for gypsy moth work.--Working conditions during April were unusually fine. The snow melted rapidly under the warm sun early in the month, but the streams did not rise beyond normal flood stage in any area where Federal gypsy moth work is in progress. Country roads improved quickly as the daily high temperatures and warm winds drew the frost out of the ground and dried the mud. By the middle of the month the drying-out process had proceeded so far that a serious fire hazard existed in the woodlands. Lack of rain caused this hazard to continue until the end of the month, and smoking or building fires in the woods was prohibited. During the latter part of April the State authorities in Massachusetts and Connecticut proclaimed the woods closed to the public, and it became imperative to immediately withdraw nearly all workers from the woodlands in both States and to confine gypsy moth work to open areas. Practically all streams in the barrier zone area were at such a low stage by the end of April that evidently there will be a serious water shortage by the time spraying work starts, unless there is a substantial rainfall in the first half of May.

Early emergence of gypsy moth.--Hatching of gypsy moth egg clusters was reported from several widely scattered localities on April 21 and 22, indicating that a general hatch may be expected much earlier than for many years. General emergence of the eastern tent caterpillar had already occurred throughout the area extending from northern Vermont to the Pocono Mountains in eastern Pennsylvania.

Gypsy moth work in Vermont during April.--Many logging operators were engaged in cutting white birch in Vermont during the winter months for shipment to wood-novelty manufacturers outside of the barrier zone. Birch logs cut after the sap rises in the trees are not accepted by the manufacturers, because an excess of sap causes the rapid discoloration of the wood, therefore most of the logging was terminated by the first of April. Gypsy moth supervisory personnel, which had been detailed to the inspection of the birch trees and logs after the suspension of W. P. A. gypsy moth work in Vermont, was released for other assignments preparatory to the opening of the spraying season. Wooded areas where spraying work is planned were examined to determine the accessibility and adequacy of water supplies for spraying machines, the condition of existing fences, and the possible necessity of erecting additional temporary fences to prevent livestock from grazing in areas where arsenical spray may be applied. Several members of the supervisory personnel were detailed to the reexamination of areas found to be infested by regular scouting crews during the winter months when the snow was deep and covered low-situated egg clusters. Numerous additional egg clusters were found and creosoted on rocks, deadwood, small bushes, and stumps.

Gypsy moth work in Massachusetts.--The number of W. P. A. workers engaged in gypsy moth work in Massachusetts has been steadily reduced as men have resigned to accept employment in private industry, and considerable difficulty is being experienced in maintaining a satisfactory working force. Most of the crews were undermanned at the end of April, despite all efforts to obtain additional workers. Fourteen W. P. A. crews were engaged in scouting for the gypsy moth in Massachusetts on the first of April. Every effort is being made to reduce the high and exposed infestations in Cummington and Chester so as to eliminate, so far as possible, the wind dispersion of small caterpillars into neighboring towns within the barrier zone.

No heavy gypsy moth infestations in several Berkshire County towns.--A small force of experienced supervisory gypsy moth employees cruised through large isolated tracts of woodland in Berkshire County, Mass., to determine whether heavy infestations existed in areas that had not been scouted for a year or more. Although several hundred acres were examined, no serious infestations were located. The small number of scattered egg clusters found thus far are not sufficient to warrant extensive spraying operations in these woodlots.

Lack of workers reduces volume of W. P. A. gypsy moth work in Connecticut.--The scouting work for the current fiscal year will not be completed in the Connecticut barrier zone area as planned, primarily because it has not been possible to maintain a full quota of men needed for the work since early last fall. On the first of April only five crews were available for gypsy moth scouting work and these crews were frequently undermanned because of the resignations of the workers, particularly in the intermediate and skilled grades, to enter private employment. Replacements failed to keep pace with the resignations during the month.

Sawdust mill operated in Connecticut.--A brush-disposal machine has been in continuous operation at gypsy moth infested sites in Cornwall Township, Litchfield County, since early in April, and has reduced large quantities of brush to small chips which were broadcast over the forest floor. The machine disposes of approximately 10 cords of compactly piled brush per day. It was originally designed for the manufacture of sawdust from mill waste in the woodworking industry, but was adapted by this activity several years ago for the disposal of brush by reducing it to coarse shavings or chips. The crew operating this machine was permitted to continue work in the State forest, acting as State agents, after the other crews had been withdrawn from the woods because of the fire hazard.

Gypsy moth field work reduced in Pennsylvania.--During April a moderate amount of field work was accomplished in the Pennsylvania area, where only a skeleton force has been working since early in March. It was necessary to drastically curtail the force at that time, as the W. P. A. funds allotted for the first 8 months of the current fiscal year had been practically exhausted. Some scouting, thinning, and ground work was done, but practically no burning was permitted, as the fire hazard was so serious that it was necessary for the State Department of Forests and Waters to open the fire towers much earlier than usual. Numerous sprayer set-ups at suitable sources of water supply have yet to be prepared, wood roads must be repaired and improved in order that heavy spraying equipment may be moved to suitable sites in or near woodland infestations, and long lines of hose should be laid in order to conserve time after spraying begins.

Permits for spraying in residential areas in Pennsylvania.--A total of approximately 2,300 permits have been obtained for gypsy moth spraying work at infested sites in residential areas in Kingston, Exeter, and Pittston in Luzerne County, and in Old Forge, Lackawanna, and Scranton in Lackawanna County, Pa. Many of the infestations are small and confined to one or two house lots but, because of overhanging shrubs, trees, and vines, permits must also be obtained from all abutting properties, in order to perform the spraying work thoroughly. The preliminary preparations for residential spraying work also included making necessary arrangements with the water company for the taking of water from their hydrants. This company has been very cooperative since the beginning of gypsy moth work in the residential sections of the gypsy moth infested area in Pennsylvania.

Further reductions in C. C. C. gypsy moth work.--There was a serious reduction in the number of man-days made available for C. C. C. gypsy moth work east of the barrier zone under the supervision of this Bureau in April. The largest number of man-days used during any week was 223, and this was reduced to only 153 6-hour man-days for the week ended April 26. A total of only 795 man-days was used on gypsy moth work during the entire period. The reductions occurred in all three States where C. C. C. gypsy moth work is performed under the supervision of this Bureau. One camp in Vermont where most of the men had been available for gypsy moth work was closed, and gypsy moth work was discontinued at another camp where a large proportion of the personnel had been engaged in this work during the winter months. Owing to the present low enrollment, to the recent loss of camps, and to a possible further reduction toward the end of the fiscal year, plans have been abandoned for manning the U. S. D. A. buildings at Fairlee, Vt., for gypsy moth work and it is understood that the buildings will soon be salvaged. The volume of C. C. C. gypsy moth work in Massachusetts was greatly reduced when the gypsy moth camp at Westfield was abandoned early in April, and a further reduction was caused by the removal of the camp at Chester. Two crews from this camp have performed gypsy moth work east of the barrier zone for several years. The loss of work east of the barrier zone from this camp will be offset to some extent ty the transferal of the two gypsy moth foremen to camps within the barrier zone, where they will be given small crews to carry on gypsy moth work in areas that can be reached from the new camps. The same number of crews performed gypsy moth work in Connecticut as during March, but the volume of work accomplished was reduced because of the smaller enrollments and the restricted areas where work could be performed.

Gypsy moth work accomplished by C. C. C. in April.--Scouting, creosoting, and selective thinning work was continued during April when men were available, with special emphasis placed on scouting work to locate infestations where spraying will be most important in June. The scouting work in one town east of the barrier zone and bordering on the Connecticut River in Connecticut showed a considerable increase in infestation. Scouting by the C. C. C. in this town was requested by the State gypsy moth organization, as numerous nurseries are located in the town and the State authorities wished to have the heaviest infestations existing in the neighborhood of the nurseries located so that they could be given consideration in arranging the State spraying program for the approaching larval season. Sites for spraying equipment at selected locations were cleared, and water holes and roads were prepared for the coming of the sprayers where such work was necessary. Salvaged barbwire, loaned to the C. C. C. about a year ago to exclude livestock from sprayed areas, was removed and returned to the Greenfield storehouse, together with three rolls of new wire supplied by a property owner to replace Government-owned wire which he did not wish to have removed from the fence. The volume of all types of C. C. C. gypsy moth work was greatly reduced during April by the necessity of holding some of the crews at the camps, or of confining their work to locations near the camps, so that they would be immediately available for firefighting if necessary, as the early warm and dry weather made the woods especially susceptible to forest fires during most of the month.

Gypsy moth less abundant in Massachusetts and Connecticut but increased in Vermont.--C. C. C. gypsy moth scouting work during the first 9 months of the current fiscal year showed a decided reduction of gypsy moth infestation in the area between the Connecticut River and the barrier zone in Massachusetts and Connecticut, as compared with the previous year. Slightly over 263,000 gypsy moth egg clusters were treated during the 9 months ended March 29, 1941, while more than 1,226,000 egg clusters were treated during the corresponding portion of the previous fiscal year. Conditions were found to be quite different in Vermont, where heavy concentration of gypsy moth infestations have been found in the Connecticut River Valley towns, and the indications are that considerable areas in that section will suffer severe defoliation later in the season.

PLANT DISEASE CONTROL

Spokane staff develops public-speaking ability.--For the last 2 years some members of the blister rust control staff of the Spokane, Wash., office have been meeting at luncheon once a week and devoting attention to experience in public speaking. Recently five of the staff members joined the Toastmasters' Club of Spokane and subsequently they have taken part in a local toastmasters' speaking contest. The public-speaking experience has had a beneficial effect on the public contacts of the blister rust control staff and regional forest officers and others have recently made particularly favorable comments concerning the ability of the blister rust personnel to express themselves clearly and readily in joint conferences.

Regular stringing versus prestringing in ribes eradication.--L. P. Winslow, of the methods development unit, reports that in the sugar pine region during the field season of 1940, a study of the relative merits of regular stringing and prestringing of crew lanes for Ribes eradication was planned and executed under the joint supervision of the operations and methods groups. Data were obtained to determine the difference, if any, between the laying of string for crew work lanes by the crews themselves as they worked the strip (regular stringing), and the laying of string for crew work lanes in advance of crew work (prestringing) by one or more men especially assigned to this work. A checkerboard system was used for the randomization of the samples. An analysis by several methods, including a "variance" analysis of the data from 103 samples comprising 14,411 acres indicates a very slight advantage for the regular stringing method. The practical efficiency of the two methods of work was determined from the final regular check maps and the differences were not significant. In general, it can be assumed that an administrative choice of method of stringing can be made safely on the basis of such factors as brush density, topography, season of year, type of labor, and amount of available supervision.

Phenological data.--In the Northeastern region the leafing out of Ribes and other vegetation was at least 2 weeks ahead of normal. C. C. Perry reports on April 28 that in Massachusetts the unprecedented heat wave in April resulted in the further advance of Ribes foliage. Cultivated Ribes plantations in the vicinity of Boston were in quarter leaf. Patches of skunk currants in Hubbardston, Mass., showed about half the plants with leaves one-half size. In the same location, however, buds of R. hirtellum were still tightly closed. In Buckland, Mass., on April 25, R. hirtellum leaves were about three-quarter size. Fruiting cankers on pine were found on that date in Buckland, with empty sacs which indicated that aeciospores were liberated as early as April 20 in that particular section. The hot weather, accompanied by a marked deficiency in moisture, resulted in one of the worst fire seasons in recent times. During the week beginning April 14, fires occurred in the State on an acreage almost equal to the entire fire-damaged area during the year 1940. W. O. Frost of Maine writes that the aecial stage of blister rust was well advanced on April 20 and will be disseminating spores much earlier than usual.

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New blister rust infections in Virginia.--J. G. Luce, Jr., reports the finding of 2 white pine infections in Bath County, Va. The infections were discovered by Agent Martin Q. Miller, in charge of control work in that county. On one area 10 trees were examined, and 3 branch cankers were found on 1 tree. On the second area 139 trees were examined and 25 were found to be infected. Twenty-four branch cankers were reported and 1 stem canker. All trees examined were native growth.

Blister rust informational work.--During March and April, Mr. Luce prepared several blister rust news items. These were published in local newspapers. W. V. Zimmer is still making good use of the Georgia blister rust moving picture film. Recently Mr. Zimmer, with the aid of the assistant State entomologist, took pictures of logging operations in Rabun County, Ga., which he plans to add to his blister rust film strip.

Annual meeting of State blister rust leaders in southern Appalachians.--The annual blister rust conference of State leaders was held in Asheville, N. C., on April 17 and 18. Each State leader gave a short summary of the work in his State and at the close of the meeting prepared a brief work plan for the remainder of the calendar year. J. F. Martin attended the meeting and discussed many points which were of interest to all. Two important points discussed were the necessity of using chemicals in conjunction with hand eradication to prevent sprouting, particularly in rocky situations, and the careful evaluation of white pine stands to make certain the pine is of sufficient present or potential value to warrant the expenditure of funds for control. L. I. Barrett, of the Southern Forest Experiment Station, attended the second day of the meeting and discussed in general the importance of white pine in the South. He called to attention the rapid growth rate of white pine in the region, how well it responds under a careful management plan and why, because of its high value, this tree species should be protected and widely propagated.

Barberry bushes found in Sandhill counties of western Nebraska.--Since January 1, rust-spreading barberry bushes have been found on 10 properties in Cass, Cherry, Johnson, McPherson, Nemaha, Otoe, Thomas, and Scotts Bluff Counties in Nebraska. The remains of a hedge approximately 150 feet long, which was planted in Thomas County in 1902, was recently destroyed. Many of the bushes had died as a result of the drought in 1934 but those that remained have been fruiting heavily. Bushes found recently in McPherson County were planted prior to 1906. It became necessary to alter survey plans somewhat in Nebraska this spring because of the lack of men waiting assignment in certain counties scheduled for survey. According to Marion E. Yount, in charge of control work, on May 1 there were 3 eradication units in the field, 1 working in Kimball and Scotts Bluff Counties, another in Hooker, McPherson, Thomas, and Cherry Counties, in west-central Nebraska, and a third in Cass, Otoe, and Johnson Counties.

Berberis chinensis found in Edgar County, Ill.--A barberry infestation of unusual interest was found in Edgar County, Ill., in the latter part of March. Some 750 bushes and sprouting bushes were located in the midst of a dense stand of silver poplar, gooseberry, and buckbrush, where farm buildings had stood some 70 years ago. Many of the bushes ranging up to 12 and 14 feet in height were dead as a result of a brush fire that swept this particular area about a year ago. Sprouts springing from the old roots covered an area about 60 by 36 feet. According to Harold B. Busdicker, assistant leader in Illinois, this location aroused considerable interest among crew members because the bushes were Berberis chinensis rather than the commonly found B. vulgaris.

Berberis vulgaris eradicated in West Virginia counties bordering Ohio and Pennsylvania.--Federal Agency (emergency) funds remaining available for expenditure in West Virginia during the current fiscal year have been budgeted for work in Brooke and Marshall Counties, where about 40 men are now employed. The project is under the immediate supervision of Stowe P. McNeill, with temporary headquarters at Moundsville. Both Brooke and Marshall Counties, according to Wm. M. Watson, leader in charge in West Virginia, are located in the B. vulgaris area of the State. To date no native barberry bushes have been found in either county. Approximately 100 men are now employed on a Bureau-sponsored project in the State W. P. A. program in the B. canadensis area of southeastern West Virginia.

Berberis vulgaris widely distributed in Augusta and Rockbridge Counties, Va.--Although no extensive infestations of B. vulgaris have been found in Augusta or Rockbridge Counties, more than 17,000 bushes and seedlings have been destroyed since the survey of these counties was undertaken. George W. Eade, State leader in charge, reports that practically all wild bushes located have been found within a radius of 1 mile of planted bushes. These counties are out of the area in which B. canadensis thrives.

COTTON INSECT INVESTIGATIONS

High boll weevil emergence.--The high survival and large numbers of hibernating boll weevils found in the ground trash examinations this spring were reported in the May 1, 1941, News Letter. Reports from field stations of the Division where hibernation cages were installed last fall also indicate the highest survival in several years. Cages containing Spanish moss, cornstalks, oats straw, broom sedge, or woods trash for shelter were installed at Florence, S. C., McIntosh, Fla., Tallulah, La., and Waco, Tex. Surviving weevils were removed from the cages as they became active after May 1. The percentage of emergence through May 9 at the different localities, in comparison with the previous 2 years, is shown in the following table.

Locality	Emergence in--		
	1939	1940	1941
	Percent	Percent	Percent
Florence, S. C------	0.47	0.02	4.2
McIntosh, Fla-------	---	2.50	2.4
Tallulah, La--------	.41	9	2.3
Waco, Tex-----------	1/ 2.14	1/ .09	5.5

1/ Total emergence for season; 1939 records for College Station, Tex.

At Florence over 200 times as many weevils emerged during the first 9 days of May 1941 as in 1940. At McIntosh the emergence was about the same, but was heavy in both years. At Tallulah the percentage of survival is already 230 times as great and at Waco more than 60 times as great as for the whole season in 1940. Emergence will continue through May and June and the indications are that weevil conditions may become serious. The damage will depend largely on weather conditions during June and July. Hot, dry weather may check their development while damp, cool weather will favor their increase.

Effect of calcium arsenate on cotton aphid multiplication.--Several applications of calcium arsenate for boll weevil control often cause the cotton leaf aphids to increase to injurious numbers. The reasons for this increase are not fully understood. It was formerly thought that the destruction of the parasites and predators by the arsenical was the principal factor, but more recent work by E. W. Dunnam and J. C. Clark, of the Stoneville, Miss., laboratory, has indicated other factors were playing a part in the accelerated multiplication of aphids. Apparently the calcium or arsenic in the insecticide is absorbed by the leaves and roots, and one or both of these elements in the cotton leaf fluids upon which the aphids feed act as a stimulus to aphid reproduction. The hydrogen-ion content of the soil and of the cell sap of plants was increased in plots dusted with calcium arsenate. Associated with this increase of pH were earlier maturity and shedding of leaves. The prereproductive period of aphids was shortened and the number of young born daily and the total number of young were increased when aphids were reared on dusted plants. Caged aphids protected from parasites and predators reproduced faster on cotton dusted with calcium arsenate containing 13.9 percent water-soluble arsenic pentoxide than on plants dusted with calcium arsenate containing 0.7 percent water-soluble arsenic. Reproduction was also slightly higher on plants dusted with hydrated lime than on the checks. In field tests at Tallulah, La., R. C. Gaines, M. T. Young, and G. L. Smith found a significantly larger number of aphids developed in plots of cotton dusted with calcium arsenate containing 10.3 percent water-soluble arsenic pentoxide than in plots dusted with calcium arsenate containing 0.5 percent water-soluble arsenic. These facts indicated that the amount of water-soluble arsenic in the calcium arsenate was the most important factor but that the lime in the calcium arsenate also contributed to the aphid increase. Tests were begun in 1939 and continued in 1940 to improve calcium arsenate so as to reduce or eliminate the build-up of aphids. Plants were dusted and sprayed with a number of substances with different degrees of pH to observe the reaction on the plants and the aphids. Plants dusted with zinc arsenate (pH 6.40) had fewer aphids and were in better condition at the end of the season than plants dusted with calcium arsenate (pH 11.80), a commercial mixture of paris green reacted with calcium arsenate (pH 11.61), magnesium arsenate (pH 9.61), and lead arsenate (pH 7.56). These results indicated that among the materials that could be used for buffering purposes, zinc salts would probably be the most suitable for use with calcium arsenate for cotton insect control. Tests are being continued with mixtures of calcium arsenate and zinc salts and calcium arsenate with ferrous salts. As a result of these investigations one of the large insecticide companies last year tested a calcium arsenate in which a zinc salt was included in the process of manufacture. Their first season's results in field tests were so satisfactory in holding down the aphid population that the zinc-safened calcium arsenate is being produced commercially on a large scale this year.

Abutilon berlandieri, a possible host plant of pink bollworm.--Plants of A. berlandieri were grown at Presidio, Tex., from seed obtained at Brownsville, Tex. On September 3, 1940, L. W. Noble placed pink bollworm eggs on the seed pods of some of these plants and on September 13 he found two second-instar larvae in the pods. In another test pink bollworm moths were released during the period from October 2 to 16 in cages set over A. berlandieri plants. On November 6 each of three pods were found to be infested with a second-instar larva. Robert F. Martin, of the Bureau of Plant Industry, verified the determination of this malvaceous plant. He states that "this species is very closely related to, if not identical with, two other species--A. permolle Sweet and A. lignosum (Cav.) Don. If these species are the same, A. lignosum appears to be the oldest." Although these tests in cages at Presidio indicate the possibility that this plant might serve as a host of the pink bollworm, in all of the observations and collections thus far made in the lower Rio Grande Valley no pink bollworms have been collected or reared from this plant.

Pink bollworm in lower Rio Grande Valley in April.--A. J. Chapman, et al., of the Brownsville laboratory, report that although resting-stage larvae of the pink bollworm were found in open cotton bolls on the soil surface in January, February, and March, none were found in the examination of 80 open bolls in April. The bolls were badly decomposed and scarce because of the heavy rains during the winter months. On September 25, 1940, about 70 cotton stalks bearing 300 open and green bolls were placed standing in a cage so that the bolls would be off the ground. On February 3, 1941, or 131 days after this cage was installed, an examination of 2 of the bolls disclosed 1 pink bollworm; on February 28, or 156 days after the cage was installed, an examination of 6 bolls disclosed 2 pink bollworms; on March 31, or 187 days after installation, the examination of 3 bolls disclosed 2 pink bollworms; and on April 29, or 216 days after installation, the examination of 3 bolls disclosed 5 larvae and 1 pupa of the pink bollworm. One pink bollworm moth was also found in this cage on April 28, or 215 days after installation. This high survival of pink bollworms on standing cotton emphasizes the importance of cutting all cotton stalks in the fall, even though all the bolls on the ground cannot be destroyed. Between August 20 and December 10, 1940, open and green cotton bolls and cotton squares were installed in 151 hibernation cages. During March and April a total of only 7 pink bollworm moths emerged. This emergence took place in 7 different cages from resting larvae in open cotton bolls on the soil surface, green bolls on the soil surface, and green bolls buried from 1 to 2 inches. The period between installation and emergence ranged from 133 to 207 days. In the first case, open bolls were placed on the soil surface in a cage on October 28 and the adult moth appeared on March 10. In the latter case, open bolls were placed on the soil surface on September 26 and the adult moth made its appearance on April 21. Owing to heavy rains, all of the hibernation cages were covered with water for a period of from 3 to 5 days from December 22 to 27, 1940, and again for 3 or 4 days between March 23 and 27, 1941. For this reason very little emergence of moths was expected from these cages. Many fruiting forms of 10 different species of malvaceous plants were examined or caged for emergence of moths during April, but no pink bollworms were found. In the Big Bend area of Texas and in the Laguna district of Mexico many pink bollworms survive the winter in loose cocoons in the soil. Apparently the pink bollworm differs in its habits in the lower Rio Grande Valley, as the examination of soil from heavily infested fields during the last 2 winters has failed to disclose a single pink bollworm free in the soil. All that have been found in or on the soil of cottonfields have been in bolls, locks, or cottonseed.

PINK BOLLWORM AND THURBERIA WEEVIL CONTROL

Planting of the 1941 cotton crop.--Planting and replanting of the cotton crop was in progress in all of the regulated areas in Texas, New Mexico, and Arizona at the end of April, and difficulties are being encountered in obtaining stands of cotton because of heavy rains followed by cool weather unfavorable to seed germination. The planting of the cotton crop was completed around the middle of April in the Coastal Bend district of south Texas, with a good stand being obtained over the area as a whole; however, during the last few days of April heavy rains throughout that district destroyed a great deal of the young cotton. Cotton planting began in the lower Rio Grande Valley of Texas on February 1, in accordance with State regulations; however, abnormal rainfall during February and March necessitated several extensions of the closing date for planting, originally set at March 15. The deadline for planting was finally extended to April 20, and it was estimated that approximately 96 percent of the crop had been planted at the close of that date. Special permits were granted, upon request, for the planting of the balance of the crop, and in the 10-day period ended April 30, permits were issued to 356 farmers for the planting of 6,247 acres which had been too wet for planting prior to April 20. In some instances, however, additional rains interfered with planting after permits were issued, and at the close of April approximately 99 percent of the 230,000 acreage had been planted. In the Mexican quarantined areas adjacent to the lower Rio Grande Valley of Texas, where similar regulations prevail in regard to cotton planting, rainfall did not interfere with the planting of the crop to such an extent as on the American side, and the entire crop had been planted at the close of April. Cotton planting was begun in the Presidio-Ojinaga area of the Big Bend of Texas and Mexico on April 20, in accordance with regulations in effect in that region, and by the close of April most of the acreage had been planted; however, rains which occurred in that area around the latter part of the month will probably necessitate some replanting. The controlled planting date for the lower Rio Grande Valley and the Big Bend, designed for the purpose of bringing about a delay in the fruiting of the cotton crop, is considered one of the most important factors in pink bollworm control in those particular areas, as through this medium attack is made on the insect at the most vulnerable point in its lifecycle--spring emergence from overwintering larvae. Moths emerging in the absence of a host on which to oviposit will die within a short time without propagating the species.

Destruction of sprout cotton.--To successfully combat the pink bollworm, there must be a considerable period throughout the year during which no food is available for build-up of infestation. Under the very favorable climatic conditions in the lower Rio Grande Valley cotton bears fruit throughout the year if not destroyed; consequently, an effort is made to kill all stalks immediately after the crop is harvested. Great difficulties are met, however, in attempting to destroy cotton in this region, and sprout plants develop throughout the year from roots left in the ground during plowing operations, thus making it necessary to carry on an intensive campaign for the destruction of sprout cotton until the fruiting of the subsequent crop. During April, 875 man-days were expended in grubbing out sprouts which gave evidence of producing blooms prior to the fruiting of the planted crop. At the end of April young squares were beginning to appear in a good many of the earlier 1941 planted fields, but it is not believed that blooms will become general until around the first of June. The Mexican Department of Agriculture is carrying on a similar program in regard to the destruction of sprout cotton in the lower Rio Grande Valley of Mexico, and work in that area was continued during April with satisfactory results. In the Anahuac region of Mexico, opposite Laredo, Tex., funds have been made available by the Mexican Government for the removal of sprout and volunteer cotton from approximately 1,200 acres of abandoned cotton land as a pink bollworm control measure, and at the end of April approximately 5,000 acres of land had been cleaned. Plans are to complete the cleaning of all acreage some time in May before the 1941 crop begins fruiting. A survey of the cotton acreage in the Coastal Bend district of south Texas during April resulted in the finding of some sprout cotton in Duval County, which it is believed will reach the fruiting stage in advance of the 1941 planted cotton. The farmers involved were contacted, and have promised cooperation in the removal of this cotton. Some abandoned fields of sprout cotton were also located in Duval and Maverick Counties. The one field in Maverick County had been cleaned at the end of April, and it is of interest to note that living pink bollworms were found hibernating in a few dry bolls. It is planned to use Bureau labor to destroy the sprout cotton in the abandoned fields in Duval County.

Wild-cotton eradication in Florida.--An effort has been under way for a number of years to eradicate the pink bollworm from southern Florida through the destruction of the wild cotton plant which harbors the insect, and thus prevent its spread northward to domestic cotton plantings. Very gratifying progress has been made in this undertaking. A great part of this work has been accomplished through Work Progress Administration allotments, and during the last two seasons a C. C. C. Camp has been set up at Cape Sable to aid in this work. For the month of April the quota of 102 W. P. A. workers was reduced to 94; however, the C. C. C. Camp, consisting of about 200 enrollees, was at full strength about half of the month. Working conditions were favorable during April throughout the entire district. The third cleaning of the season was completed in the Cape Sable area toward the close of April, and the work in that region was terminated for the season. This is the first time the Cape Sable area has been covered three times in one season, and this was possible on account of having sufficient man power furnished by C. C. C. and W. P. A. agencies. Almost half a million fewer plants were found in the Cape Sable area this season than last, indicating a reduction in the number of dormant seed in the soil. A third cleaning of the season is in progress in the Bradenton-Fort Myers subdistrict and the third cleaning for the Main Keys area made good advancement during April. The houseboat crew of the Cape Sable subdistrict was engaged in a second cleaning of the Ten Thousand Islands section during April, and the houseboat crew of the Keys subdistrict was engaged in cleaning colonies along the Dade County mainland. During April a total of 9,692 acres was covered, from which were removed 3,588 mature plants, 44,456 seedlings, and 81 sprout plants. In addition to the acreage cleaned, more than 11,000 acres was scouted and no plants were found thereon.

TRUCK CROP AND GARDEN INSECT INVESTIGATIONS

Performance of narcissus bulbs treated for control of bulb fly during the growing season.--Using bulbs from field plots of narcissus which had received during the growing season of 1940 various insecticidal treatments for the control of the narcissus bulb fly (Merodon equestris (F.)), Ralph Schopp and Paul M. Eide, of the Sumner, Wash., laboratory, found that none of the treatments employed had a detrimental effect on the forcing performance of the bulbs in the greenhouse during the latter part of the winter of 1940-41. The sample bulbs were from four experiments, two of which involved application of the lead arsenate-mineral oil emulsion spray mixture known as "Dynamite", one employing the application of naphthalene flakes, and the fourth from the use of several miscellaneous materials. The first of the experiments with the "Dynamite" spray was to test the effectiveness of the ingredients by eliminating one at a time from the complete formula, while the second was to determine the effectiveness of each ingredient when used separately. The third experiment involved sprinkling dry naphthalene flakes on the soil around the necks of the bulbs at rate of 1/2, 1, 1-1/2, and 2 pounds per 100 feet of row. The experiment employing miscellaneous materials included application of spray mixtures containing mineral oil emulsion, amyl acetate-mineral oil, carbon disulfide-mineral oil, and dust mixtures of cube and sulfur and cube and bentonite. Untreated plots were included in all of the experiments. To determine any effect of the treatments upon the utility of the bulbs for forcing in the greenhouse, data were obtained on the length of time required for flowering, on the measurements of the flower stem and flower parts, and the general condition of the flower. Twenty sample bulbs were taken from each treatment in the field and used for the forcing tests. The bulbs were planted in flats and buried outside on October 9, 1940, and transferred to the greenhouse for forcing on December 30.

Performance of narcissus bulbs treated for control of bulb fly after digging.--F. S. Blanton, of the Babylon, N. Y., laboratory, found that narcissus bulbs could be forced in the greenhouse following treatments used to control the narcissus bulb fly in the bulbs after digging. Different lots of bulbs were subjected at intervals of 1 week for a period of 10 weeks after digging to each of the following treatments: (1) Calcium cyanide at a dosage of 16 ounces to 100 cubic feet for 4 hours; (2) sodium cyanide at a dosage of 7 ounces to 100 cubic feet for 4 hours; (3) vapor heat at 110° F. for 2 hours, exclusive of the 1-hour approach period; and (4) hot water at 110° F. for 1 hour, exclusive of 1/2-hour approach period. The period during which treatments were made was August 8 to October 10. There was no apparent injury to the flowers from any of the treatments but there was slight foliage injury on those given the hot-water treatment at the 8th, 9th, and 10th weeks, and the number of flowers produced by those receiving the hot-water treatment was somewhat reduced. At the time of planting there was some damage apparent on the bulbs receiving the cyanide treatments for the first, second, and third weeks. This injury was evidenced by a charred appearance, which was followed by the fungi Rhizopus and Penicillium. There was a yield of 171 flowers from the bulbs receiving the calcium cyanide treatment, 169 from the sodium cyanide treatment, 174 from the vapor heat, 140 from the hot water, and 167 from bulbs not treated, the total number of bulbs forced being 250 for each treatment or 25 from each weekly application of each treatment.

Control of cabbage caterpillars on commercial plantings.--The tests conducted by W. J. Reid, Jr., of the Charleston, S. C., laboratory, on fields of fall-growing cabbage during the fall and winter of 1940 showed that effective control of cabbage caterpillars including the cabbage looper (*Autographa brassicae* (Riley)), the imported cabbage worm (*Ascia rapae* (L.)), the diamondback moth (*Plutella maculipennis* (Curt.)), and Agrotinae, and their damage, was obtained under commercial conditions by employing the control program found to be most effective in experiments previously carried out on small-plot plantings of cabbage. The control program used consisted of making applications of insecticides to the cabbage at intervals of 10 days throughout the growing period, the ones prior to the time heading began consisting of dust mixtures of cryolite or arsenicals, with those during the heading period being dust mixtures containing rotenone, pyrethrum, or both of these ingredients. The insecticides used, the numbers of applications, and the percentages of cabbages damaged by caterpillars at harvest for each of the 10 commercial plantings included in this experiment are shown in the following table.

Farm No.	Planting	Number of applications of arsenicals or cryolite before heading	Applications after heading		Cabbage damaged by caterpillars at harvest
			Number	Insecticide	
					Percent
1------------	A	4	3	Derris-pyrethrum	1.5
	B	4	3	Derris	4.5
2------------	A	3	3	Derris-pyrethrum	2.5
	B	1/3	3	Derris	2.5
3------------	A	1/4	3	Derris-pyrethrum	4.5
	B	4	3	Derris	3.5
4------------	A	4	3	Derris-pyrethrum	7.2
	B	4	3	Derris	9.0
	C	4	3	Pyrethrum	7.1
	D	Untreated	Untreated	--	53.1

1/ Through error the first application consisted of a derris-dust mixture containing 1 percent of rotenone.

These data show that, except for one farm, adequate commercial control of the caterpillar damage was obtained by the use of an arsenical or cryolite dust during the preheading stage followed during the heading period by applications of derris or derris-pyrethrum dusts. On the one farm the dusting schedule was not continued quite long enough for the control to be entirely adequte, but even in this instance (Farm No. 4) the net profit resulting from use of the insecticides ranged from $69 to $73 per acre.

Corroborating the results obtained from previous experiments of a similar nature the derris-pyrethrum dust showed a tendency to be slightly superior to the derris dust in certain respects. The insecticides applied prior to the time when heading of the cabbage began were the same for any one farm and consisted of cryolite and a diluent (1-2), or of arsenicals as preferred by the grower, while those after heading began were derris dust containing 1 percent of rotenone or derris-pyrethrum dust containing 0.5 percent of rotenone and a 0.15-percent Pyrethrins I and II content, or a pyrethrum dust containing 0.3 percent of Pyrethrins I and II. There were three or four preheading applications at rates of 10 to 15 pounds per acre per application with three post-heading applications at rates of 15 to 25 pounds per acre per application. All dust applications were made by traction dusters. Each planting of cabbage on Farms Nos. 1, 2, and 3 was 1 acre in size, whereas those on Farm No. 4 were 1/2 acre.

Hemipterous-insect damage to sugar beets grown for seed.--Field isolation-cage studies were conducted by O. A. Hills at Phoenix, Ariz., during the 1940 season to determine the amount of damage to sugar beets grown for seed attributable to feeding by various species of Lygus and of Chlorochroa sayi Stal. (Say's stinkbug). Studies in 1939 showed that these insects did not reduce the yield of seed, but rather were responsible for a reduction in the percentage of viable seed produced. Germination tests of the beet seed produced under caged conditions in 1940 were completed during January and show that individual adults of C. sayi damaged an average of over 200 seed balls during the developmental period of the seed, while the damage by individuals of the species of Lygus averaged 62 to 91 seed balls during the same period, the total number of seed balls produced per cage being about 400. These studies also showed that L. elisus Van Duzee was responsible for significantly less damage than L. hesperus Knight or L. pratensis oblineatus (Say) and that the females and nymphs of all species were responsible for more damage than were the males of the same species. The data further indicate that Lygus feeding renders the entire seed ball nonviable, whereas C. sayi, in addition to rendering a larger number of seed balls nonviable, may also affect one or more seed of a seed ball without rendering the entire ball nonviable.

Potato psyllid fails to overwinter on red cedar.--The results of cage studies conducted by R. L. Wallis at the Scottsbluff, Nebr., laboratory last winter corroborate those of similar studies which he carried out during the winter of 1939-40, in that they showed that adults of the potato psyllid (Paratrioza cockerelli (Sulc)) did not overwinter on red cedar trees, although this tree had been previously reported as the natural overwintering quarters of this pest. In the series of experiments conducted last winter no living psyllids were found at any examination. In similar experiments the previous winter no live psyllids were found after December 26, 1939; however, 84-percent mortality had occurred prior to that date during comparatively mild weather. In the winter of 1940-41 subzero weather occurred early in November and again early in December and this probably accounts for the early mortality last season. In these tests 100 adults of the psyllid were confined during the latter part of October in each of the cages placed around branches on red cedar, one of the cages being removed each week during the period December 2, 1940, to March 24, 1941, to determine whether it contained living psyllids.

Impregnated pyrethrum dusts effective against tobacco thrips.--From an experiment carried out during 1940 on replicated small plots at the Windsor, Conn., laboratory, A. W. Morrill, Jr., concludes that impregnated pyrethrum dusts containing 0.5 percent of Pyrethrins I and II, using exhausted pyrethrum flowers as the carrier, shows considerable promise against the tobacco thrips (Frankliniella fusca (Hinds)) when applied to infested cigar-wrapper tobacco growing under shade. Evaluations of damage by thrips on the cured leaves of tobacco from plants that had received 7 applications of this insecticide showed that an average of only 7 percent of the potential yield of cigar wrappers was damaged, as compared to 59 percent of the wrappers of leaves taken from plants that received no insecticidal treatment. The percentage of wrappers damaged by the thrips on plants receiving 7 similar applications of a cube-tobacco dust mixture containing 1 percent of rotenone was 18, whereas for plants treated alternately with this dust mixture and the pyrethrum dust, only 12 percent of the wrappers was damaged by feeding of the tobacco thrips. Two spray mixtures containing pyrethrum and rotenone were less effective in reducing damage by the thrips than the dusts. The dusts were applied by rotary hand-operated dusters at an average rate of about 8.5 pounds per acre per application and the sprays were applied by knapsack sprayers at an average rate of 37 gallons per acre per application, the 7 applications of each insecticide being made at semiweekly intervals beginning July 2. The 6 treatments were replicated on 36 plots 1/40 acre in size arranged in a Latin square, and the effectiveness of the treatments was determined by examining after curing and classifying as to the presence of thrips damage to the leaves from 10 plants per plot.

INSECTS AFFECTING MAN AND ANIMALS

Mosquito survey at Savannah air base.--At the request of the Public Health Service, G. H. Bradley, of the New Smyrna Beach, Fla., laboratory, spent the period April 22 to 24, inclusive, in making a mosquito survey and estimating the needs for a W. P. A. mosquito-control project in the vicinity of the Savannah, Ga., air base.

Creosote spray for sandfly control.--In preliminary tests made by J. B. Hull and S. E. Shields, of the St. Lucie, Fla., laboratory, 200 feet of ditch was sprayed with creosote oil at the rate of 1 gallon of creosote to 100 feet of ditch. Only 1 larva was isolated from three 1-quart samples 18 days later. From an untreated ditch 150 feet away almost 100 larvae were isolated from each sample.

Dog fly breeding places.--W. E. Dove and S. W. Simmons, of the Panama City, Fla., laboratory, report that a survey was made for breeding places of dog flies in the dairies of Bay County, Fla. Of 14 dairies inspected, breeding was found in 6.

FOREIGN PLANT QUARANTINES

Entomological interceptions of interest.--Two living and 28 dead larvae of the Mediterranean fruitfly (Ceratitis capitata (Wied.)), were taken at Seattle on April 25 in apples in ship's refrigerator from Queensland. Living specimens of the endomychid Trochoideus americanus Buq. were intercepted at Hoboken, N. J., on April 3 with Cattleya sp. in cargo from Colombia. A living adult of the colydiid Sosylus cursorius Pasc. was taken at New York on April 10 on a primavera log from Mexico, and S. duplicatus Pasc. was taken at New York on April 11 under the bark of a primavera log from Guatemala. A living specimen of the lygaeid Ozophora gracilipes (Stal) was taken at Hoboken, N. J., on April 4 on Cattleya sp. in cargo from Venezuela. One larva of the gelechiid Gnorimoschema lavernella (Chamb.) was found at El Paso, Tex., in husk tomato in baggage from Mexico. A living adult of the curculionid Pyropus sapphirinus Gyll. was intercepted at New York on March 24 on mustard greens in cargo from Cuba. Specimens of the coccid Ceroplastes ceriferus (And.) were intercepted at San Francisco on March 7 on Camellia sasanqua in baggage from Japan. A living adult of the lyctid Lyctoxylon japonum Reitt. was intercepted at Norfolk, Va., on April 16 in bamboo dunnage in quarters from Java. Specimens of the bruchid Bruchus dentipes ochreasignatus Heyden were found at the Inspection House, Washington, D. C., on April 22 in Vicia hybrida seeds in express from Iran. Although the specimens were dead, H. S. Barber stated that they were the first good specimens received here. A living adult of the cydnid Galgupha schulzii (F.) was found at San Francisco on March 31 on Oncidium splendidum in cargo from Guatemala. A living larva of the curculionid Metamasius sp. was found at Presidio, Tex., on March 2 in a sugarcane stalk in baggage from Mexico. A living adult of the lygaeid Ozophora pallescens (Dist.) was intercepted at New York on April 9 with string beans in stores from Cuba. Specimens of the bruchid Bruchus hamatus Miller were intercepted at the Inspection House, Washington, D. C., on April 18 in unidentified seeds of a forage plant in express from Iran.

Pathological interceptions of interest.--Ceratostomella ips Rumbold was found on April 17 at Hoboken on a pine cleat in cargo from England. C. ulmi (Schwarz) Buis. was intercepted on April 3 at New York in elm wood in a crate from England. Cercospora coffeicola Berk. & C. was intercepted on March 4 at Hoboken on coffee leaves in baggage from Mexico. Cumminsiella sanguinea (Peck) Arth. was intercepted on March 12 at Hoboken in Mahonia leaves from British Columbia. Dendrodochium lycopersici Marsh, a little-known fungus described in Belgium in 1901, was intercepted on tomatoes from Mexico April 10, 1940, and on February 15, 1941, at Brownsville. Gloeosporium lebbec Syd. was intercepted on February 24 at New Orleans on Albizzia lebbeck pods from Honduras. Heterodera marioni (Cornu) Goodey was intercepted on March 28 at Seattle on Anemone pulsatilla vernalis from Canada. Kellermania sp. and what appeared to be immature Asterina mexicana E. & E. were intercepted on March 19 at El Paso on maguey leaves in baggage from Mexico. Phyllachora maydis Maubl. was found on March 24 at New York on corn leaves in cargo from Guatemala. Peridermium sp., material too scanty for a specific determination, was found on March 3 at El Paso on needles of Picea sp. in baggage from Mexico. Peronospora effusa (Grev.) Ces., common on spinach from Mexico, was found in March at Nogales on Chenopodium sp. in baggage from Mexico. P. pisi (De Bary) Syd. was found on April 15 at New York on peas in stores from Portugal. Uredo guacae Mayer was intercepted on January 10 at Hoboken on Epidendrum sp. entering under special permit from Venezuela. U. jucunda Sacc. was intercepted at Hoboken on February 21 on Philodendron sp. in mail from Costa Rica. Uredo sp., none found reported on Miltonia, was intercepted on March 26 at Brownsville on Miltonia vexilans from Mexico.

DOMESTIC PLANT QUARANTINES

Grasshopper development.--Hatching of *Melanoplus mexicanus* Sauss. was reported at the close of April as complete in two Arizona counties. Two mixing stations were in operation in Yuma County, Ariz., and demands for bait were increasing. Hatching of this species was also in progress in northern Texas, Oklahoma, Kansas, Nebraska, South Dakota, and the vicinity of Ames, Iowa. *M. bivittatus* Say, according to reports, was hatching at Ames the latter part of April, and *Aeoloplus turnbullii* Thos. in Texas, Oklahoma, and Kansas. A light and general grasshopper hatch was reported from many counties in Utah. Infestations of moderate intensity in southern California were present and baiting operations were expected to begin early in May in San Bernardino and Kern Counties.

Mormon cricket migration stopped.--A Mormon cricket band with a front 6 miles wide was recently observed moving into cultivated areas at Warm Springs, northwestern Oregon, within 150 yards of the town. The application of sodium fluosilicate bait with power equipment in advance of the crickets completely stopped the migration. After feeding on the bait they failed to advance more than 150 feet, a 98-percent kill was effected, and no damage to crops resulted.

Other Mormon cricket control work.--The hatching of Mormon crickets is almost complete in areas of low altitude throughout the infested region. In areas of high altitude the hatch will continue for some time. Adult crickets were observed at the close of April in Washington and Oregon. In Nevada the hatch was somewhat retarded by storms early in the month. In Utah heavy populations of crickets which had not migrated from the egg beds were effectively dusted, resulting in an 85- to 95-percent kill, in some sections 100 percent. Such early dusting of crickets while they are still concentrated on the hatching grounds, is a most economical type of control. In Oregon large-scale cooperative control operations have been conducted in Wasco and Jefferson Counties, and on the Warm Springs Indian Reservation and land adjacent thereto. Power-dusting was begun in Nevada on April 21, and extensive preparations are being made for large-scale applications of both sodium-arsenite dust and sodium-fluosilicate bait. A considerable number of pick-up trucks, power bait-spreaders, and bait mixers have been transferred to the areas in Nevada and Oregon where extensive control operations are anticipated. During April a total of more than 3,000 acres was dusted and nearly 20,000 acres spread with cricket bait.

White-fringed beetles show early development.--Field employees of the white-fringed beetle control project, working in close cooperation with the members of the Division of Cereal and Forage Insect Investigations, are making studies of the development of the beetles so that information may be available in each of the infested areas as to the time when beetle emergence may be expected. The time when control measures are to be started in each area is based largely on such information. The pupal stage was found at New Orleans on April 22 and in the Florala, Ala., area on April 26, 10 days earlier than the first pupae were found at

Florala in any previous year. These findings indicate an early emergence, which may be accounted for by unusually dry weather throughout the infested area.

Control work on white-fringed beetle has begun.--Direct control measures against the white-fringed beetle were begun at Mobile, Ala., on April 30 and were going forward in the early part of May in all isolated areas, where the most drastic type of suppressive measures are to be continued throughout the entire period of emergence to determine the possibility of eradication. Materials and supplies needed to carry on the work throughout the season have been ordered to the extent that available funds will permit.

Beetle control at Army Center.--A recreational center to be used by the Army personnel on holidays and week ends has been established within the white-fringed beetle infested area at Gulfport, Miss. The site was selected by the Army officer in command, in cooperation with the project employees, and the Army has cooperated in the establishment and maintenanceof adequate sanitation measures to prevent the beetles from being carried to points outside the area.

White-fringed beetle administrative instructions modified.--Under a revision of circular B. E. P. Q.-485 which became effective May 1, the certification requirements of the white-fringed beetle quarantine were waived for the current year as to certain articles shipped from designated parts of the regulated area. Such modification is justified, it is believed, because of the decrease in intensity of infestation in certain parts of the area. No modification has been made in the restrictions requiring certification of soil, whether moved independently of or attached to nursery stock or other things.

New white-fringed beetle infestation found by use of power sifter.--During test runs made by the new power sifter recently developed by the technical unit of the white-fringed beetle control project, a new infestation was discovered on a railroad right-of-way at Crichton, Ala., a suburb of Mobile. The sifting machine has proved practicable in detecting the presence of larvae, pupae, and adults in any soil except the very heavy types of clay or gumbo and even in these soils there are indications of a fair degree of efficiency.

W. P. A. project on sweetpotato weevil control in Mississippi.--Labor has been assigned by the State W. P. A. Administrator's Office in Mississippi and clean-up operations are now under way in sweetpotato fields, seedbeds, and storage banks in the areas immediately south of the counties from which it is believed that the weevils have been eradicated as a result of cooperative Federal-State operations conducted since 1937.

The sweetpotato weevil and wild host plants.--In Thomasville, Thomas County, Ga., additional infestations of the sweetpotato weevil have been found in native host plants. While it is not known whether the weevil can perpetuate itself throughout the year on these wild plants, field work is now being conducted, with the assistance of labor furnished by the Works Progress Administration, to eliminate all such host plants in the city and its environs. Further careful inspections are being made in Georgia and in other affected States to determine the status of wild host plants with respect to such infestations. This inspection is carried on jointly with members of the research unit and the State cooperators.

Clean-up work on infected citrus hedges in Navasota, Tex., completed.--On the discovery of citrus canker on Citrus trifoliata hedges at Navasota, Grimes County, Tex., last January, a staff of trained inspectors was assigned to make a thorough inspection of the 75 hedges in the town, and W. P. A. laborers were obtained for tree-removal work in the area. The town of Navasota was completely inspected, as well as all of Grimes County. Citrus canker was found on 355 trees on 6 properties in Navasota. All the infected trees were promptly destroyed, as well as over 12,000 noninfected citrus trees on the infected properties. It seems likely that with the exception of possibly 1 or 2 hedges all citrus trees will be removed with the force of 135 relief laborers. Inspection has also been made of two contiguous counties without finding canker. A survey has been completed of major towns of central and northeastern Texas covering the route between Houston and Dallas. Numerous citrus hedges in this noncommercial area were located, inspected, and recorded.

Transit-inspection station changes.--In April the transit-inspection stations at Philadelphia and Cincinnati were closed and the inspectors at these cities were assigned to Dallas, Houston, and Pittsburgh. Transit inspection at Birmingham has also been suspended.

Transit inspection in the Northeast.--The movement of nursery stock in the Northeastern States reaches its highest point in April. This year the peak occurred early in the second week and maintained its level throughout the month. Some 75,000 shipments were inspected and over 6,000 waybills were examined during the 30-day period. Inspectors in this area reported 225 shipments that were moving in violation of 1 or more of 4 different Federal plant quarantines. These were consigned to 36 States and Canada. Sixty-two irregularities of various State regulations were also reported to the proper officials. Every inspector in this region has commented on the tremendous number of Ribes shipments observed this season. Buffalo, N. Y., is proving to be one of the most important points for enforcing the white-pine blister rust quarantine, affording protection to the white pine growing States of the Northeast, and to the Lake States. A carload of rose stock, consisting of 40,000 bushes, consigned to Canada was reported at New York because of the lack of Japanese beetle certification. Canadian authorities were promptly advised of this movement and they made an inspection of the stock at its destination. This is the third carload of uncertified quarantined material that has been intercepted at New York City during the present fiscal year.

CONTROL INVESTIGATIONS

Methyl bromide fumigation accelerates egg hatching.--Gypsy moth eggs fumigated with sublethal dosages of methyl bromide in November hatched from 18 to 33 days in advance of control eggs kept under like conditions in an unheated laboratory room, in tests reported by Randall Latta, of this Division, and C. H. Gaddis, of the Division of Japanese Beetle Control. However, in eggs kept in outdoor storage there was no apparent difference in the time of hatching. J. W. Bulger reports the same acceleration in the hatching of eggs of the tent caterpillar at Hoboken, N. J. In these tests made in February, some dosages were sublethal and hatching occurred several days in advance of the controls when both were kept in a laboratory room.

INSECTICIDE INVESTIGATIONS

Insecticidal use of aminoacetanilides patented.--On April 29, 1941, Lloyd E. Smith was granted U. S. patent 2,239,832, which covers the insecticidal use of ortho-, meta-, and para-aminoacetanilides. The para derivative has given promising results when tested against the following insects: Southern army worm, melon worm, bean leaf roller, cabbage looper, cross-striped cabbage worm, and imported cabbage worm. The p-aminoacetanilide, at a concentration of 8 pounds per 100 gallons of water, was tested against potato, eggplant, tomato, pepper, and bean foliage, with no injury noted 10 days after the application of the spray. This patent is assigned to the Secretary of Agriculture.

Anabasine.--About 10 years ago the Amtorg Trading Corporation of New York City, American representatives of the Soviet Union, marketed in this country an aqueous solution of anabasine sulfate containing 40 percent anabasine. This came into considerable use, especially in Connecticut, for combating aphids. As a contact spray against the bean aphid, anabasine was shown to be four or five times as toxic as nicotine. Since 1936 anabasine has not been available on the American market, probably because the entire production was consumed in Russia. Formerly obtained only from the Asiatic weed Anabasis aphylla, anabasine is now known to occur in the tree tobacco Nicotiana glauca, which grows in the Southwestern States. Russian investigators have produced hybrids of Nicotiana glauca x N. rustica which contain as much as 7 percent of anabasine. The commercial cultivation of the tree tobacco and its hybrids seems possible in the United States. The latest information concerning anabasine is reviewed in the mimeographed publication E-537.

Physical behavior of some mixed organic insecticides.--In the control of the screwworm, it was observed that a number of organic insecticides were effective when applied as dust, but when such dusts were mixed (in order to enhance their effectiveness), they were found to liquefy. A number of binary systems of such organic insecticides have been investigated by O. A. Nelson. The systems examined were: Diphenylamine and phenoxathiin, diphenylamine and paranitrophenetole, diphenylamine and nitronaphthalene, and diphenylamine and dibenzofuran. It was observed that at the optimum concentration paranitrophenetole and nitronaphthalene each lowered the melting point from 52.8° to about 24° C., phenoxathiin to 26.4° C., and dibenzofuran to 34.5° C. Other systems will be examined and the results of the previous investigations will be published.

The red-color test for rotenone.--J. W. Wood and L. D. Goodhue have been making a study of the factors involved in the "red-color" test for rotenone and deguelin. In this test an alcoholic alkali nitrite solution is added to an acetonic solution of a substance containing rotenone or deguelin, followed by the addition of a dilute solution of sulfuric acid. The heat of reaction is removed in a cooling bath. Since the test is becoming popular and has been used without due regard for interfering substanceswhich might be present, it was deemed advisable to investigate some of these and to vary the conditions of the test. Approximately 70 organic compounds were tested for their effect, using the standard testing procedure. The compounds mesityl oxide, diacetone alcohol, methyl cellosolve, butyl cellosolve, paraldehyde, methylal, and isatin gave appreciable increases of color, while certain concentrations of ethyl acetoacetate, ethyl butyl acetoacetate, ethyl-alpha-acetoxy propionate, ethyl lactate, ethyl malonate, acetyl acetone, and chloroform prevented the formation of any red color. The effect of the other substances tested was less pronounced. Doubling the concentration of the alkali used with the sodium nitrite gave a color value almost double in terms of rotenone. Doubling the amount of nitrite, however, decreased the color value approximately one-third, whereas decreasing the amount of nitrite to a certain point increased the color. Slight variations in the temperature of the cooling bath had little effect on the test. A detailed account of this investigation is being prepared for publication.

BEE CULTURE

Pollen from alfalfa in Arizona.--While Geo. H. Vansell, Davis, Calif.,has reported of his field studies in locations with miscellaneous pollen sources that the number of honeybees observed collecting alfalfa pollen was almost negligible, he also reported in the Journal of Economic Entomology for February 1941 that honeybees worked alfalfa blossoms freely in the Imperial Valley, where other pollen sources were relatively scarce. In reporting later similar evidence from Arizona, he states: "A pollen trap during the summer of 1940 at Chandler, Ariz., yielded a fairly large amount (25 lbs.) of pollen. Beginning late in April and continuing to August the predominating pollen was of a pale graying yellow color. Recent microscopical examination indicates that this supply was from alfalfa. The size and shape of the grains are indistinguishable from those taken from the bees visiting alfalfa in Imperial Valley. It is noteworthy that Arizona consistently produces a large quantity of alfalfa seed. A correlation may exist between intense pollen activity and seed set."

IDENTIFICATION AND CLASSIFICATION OF INSECTS

Two interesting records of Bruchidae.--A species of bruchid has been taken recently in seeds of *Piscidia* from the Island of St. Thomas. It agrees well with the description of *Bruchus podagricus* F. and probably is that species, which is now listed in the genus *Pseudopachymerus* (a synonym of *Caryedes*). Apparently no definite recovery of *P. podagricus* has been recorded since the species was described in 1801. The type was stated to have come from "America meridionalis;" in all likelihood it had been sent to Fabricius from St. Thomas. A new and very distinct species of *Bruchus* has been recovered from seeds of a species of *Cicer*, related to the chickpea. This is the first record of *Bruchus* from any plant of that genus. It is now known that all five genera of the leguminous tribe Vicieae found in the Mediterranean region are infested by one or more species of the genus *Bruchus*.

Another European weevil in North America.--An example of how a non-economic exotic species which, though common and widely distributed in North America, may long escape detection, came to light recently when W. J. Brown, of the Canadian Department of Agriculture, sent in two specimens of the European weevil *Rhinoncus castor* (F.) which had been collected in New Brunswick. Examination of the United States National Museum collection of *Rhinoncus* shows that *castor* has been present (confused with *pyrrhopus* Boh.) in the nearctic fauna at least since 1895, and apparently is now firmly established, its general range in the United States being from Maine to Virginia and west to Wisconsin; in addition, a few specimens are at hand from Washington and Oregon, and from Vancouver, British Columbia, and Ontario, Canada. Mr. Brown states, in litt., that this species is perhaps the most abundant ceutorhynchid in southeastern Canada, where it is known from numerous points in Nova Scotia, New Brunswick, Quebec, and Ontario. In Europe *castor* is widely distributed and is reported as feeding or breeding on *Rumex*, *Polygonum*, *Oenanthe*, and *Phellandrium*; and there are doubtless other host records in the literature. *Rhinoncus castor*, which was first described from Germany, has an American "counterpart" or "homologue" in the abundant and widespread native species, *R. pyrrhopus* Boh. A similar correspondence exists between the other two native American species of *Rhinoncus* and their European relatives,--namely, *longulus* Lec. (N. America) and *perpendicularis* (Reich.) (Europe) forming one pair, and *occidentalis* Dietz (N. America) with *pericarpius* (L.) (Europe) another pair. In American literature *occidentalis* Dietz is usually placed as a synonym of *pericarpius* (L.), but incorrectly so, the relationship between them being of the same homologous sort (though apparently closer) as that between *pyrrhopus* and *castor*. Although *pyrrhopus* and *castor* now occur together over a wide area in North America, no evidence of merging, which might be expected in two forms obviously so closely related, has been noted. The most useful distinguishing characters for *castor* are its blackish ground color, large elytral tubercles or asperities, and feebler pronotal sulcus; in the usually reddish *pyrrhopus* the elytral asperities are considerably smaller and the pronotal sulcus deeper.

Cophes longiusculus (Boh.) in the United States.--Six specimens of this Mexican weevil, labeled "Brownsville, Tex., Dec. 17, 1911," have been received from H. H. Ross, of the Illinois Natural History Survey. So far as known, this is the first report of the occurrence of *C. longiusculus* in the United States. Another Mexican species of Cophes (*C. gibbus* Champ.) was recorded from near Tucson and in the Santa Rita Mountains, Ariz., by E. C. Van Dyke in 1930.

Additions to the collection of Orthoptera.--In the course of trips primarily intended for the study and collection of leafhoppers, P. W. Oman has collected many small lots of Orthoptera. A small collection made in 1937 in the Baboquivari Mountains and in the vicinity of Hereford, near the Mexican border in Arizona, has recently been incorporated in the main collection of the Museum, and has been found to include several grasshoppers that represent valuable additions. One species, *Perixerus gloriosus* Heb., was not in the collection before, and the following are deserving of mention because of the small number of specimens previously available for study: *Acantherus piperatus* Scudd., *Morsiella flaviventris* (Bruner), *Conozoa carinata* Rehn, *Phrynotettix tschivavensis* (Hald.), *Leprus robustus* Heb., *Schistocerca albolineata* (Thos.), *Melanoplus thomasi* Scudd., and *M. desultorius* Rehn. *Melanoplus thomasi* is not unusual in favorable habitats, but so few specimens have been received that good series of the species are desirable. *Melanoplus desultorius* is a short-winged species related to *M. aridus* (Scudd.) and a member of a section of the genus *Melanoplus* that has been somewhat confused in the past.

Adult ticks abundant in Maryland in April.--Although adults of the American dog tick (*Dermacenter variabilis* (Say)) occasionally appear in Maryland in April, usually they are not abundant until late in May or in June. On April 27 several active adult ticks were removed from clothing after about an hour's collecting in Mattowoman Swamp, in southern Maryland. The almost continuous warm or hot weather in the latter part of April undoubtedly had caused the ticks to appear, in numbers, earlier than usual.

The squirrel flea as a pest of man.--Several years ago, at Ames, Iowa, a forestry student asked for the identification of a flea he had found feeding on his arm. It was identified by Irving Fox as *Orchopeas wickhami* (Baker), a common eastern flea whose normal hosts are various squirrels, and which was not known to attack man. Recently another instance has indicated this species as a possible pest. Several specimens were submitted for identification after causing annoyance in a house in Lexington, Ky. From these records it appears that this flea is capable of attacking man, and in this capacity is a potential vector of plague.

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